DX9200HDDI Series
IDE Video Storage Unit

$C\,\epsilon$

c (UL) us
LISTED

C637M-B (10/03)

CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

REGULATORY NOTICES

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and the receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

IMPORTANT SAFEGUARDS AND WARNINGS

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult your electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched, particularly at the plug, convenience receptacle, and the point where it exits from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when using the cart/apparatus combination to avoid injury from tip-over.

13. Unplug the apparatus during lightning storms or when used for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, the apparatus does not operate normally, or the apparatus has been dropped.

15. Apparatus should not be exposed to dripping or splashing, and no objects filled with liquids, such as vases, should be placed on the apparatus.

16. Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

17. To reduce the risk of shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

DESCRIPTION

The DX9200HDDI video storage unit is one of the components of the DX9000 system. The storage unit contains up to 14 IDE hard disk drives for storing video information from the DX9000 recorder. Up to four IDE storage units can be connected to a recorder.

The storage unit uses redundant arrays of independent disks (RAID) technology. Level 5 or Level 5+1 is available. In Level 5, data is divided between drives in such a way that if one drive fails, the data can be reconstructed from the remaining drives. Level 5+1 is similar to Level 5, but it includes a hot spare drive. If a drive fails, the redundant data relocates automatically to the hot spare and begins the reconstruction process without user intervention.

Features include:

* 14 hot-swappable Ultra DMA hard drive trays
* Maximum storage capacity of over 3 terabytes
* Fault tolerant data protection
* Supports redundant arrays of independent disks (RAID) levels 5 and 5+1
* Automatic detection and disconnection of failed hard drives
* Automatic online rebuild of new hard drives
* Industry standard 19-inch (48.26 cm) wide rack-mountable chassis

WARNING: The storage unit's configuration has been preprogrammed in the factory for either RAID 5 or RAID 5+1 based on the order received. Do not attempt to change the unit's configuration. Doing so can render the unit inoperable.

MODELS

The following models use 120 GB IDE hard drives.

DX9200HDDI-720	Storage unit with 6 IDE hard drives totaling 720 GB
DX9200HDDI-840	Storage unit with 7 IDE hard drives totaling 840 GB
DX9200HDDI-960	Storage unit with 8 IDE hard drives totaling 960 GB
DX9200HDDI-1080	Storage unit with 9 IDE hard drives totaling 1080 GB
DX9200HDDI-1440	Storage unit with 12 IDE hard drives totaling 1440 GB
DX9200HDDI-1560	Storage unit with 13 IDE hard drives totaling 1560 GB
DX9200HDDI-1680	Storage unit with 14 IDE hard drives totaling 1680 GB

The following models use 250 GB IDE hard drives.

DX9200HDDI-1500	Storage unit with 6 IDE hard drives totaling 1500 GB
DX9200HDDI-1750	Storage unit with 7 IDE hard drives totaling 1750 GB
DX9200HDDI-2000	Storage unit with 8 IDE hard drives totaling 2000 GB
DX9200HDDI-2250	Storage unit with 9 IDE hard drives totaling 2250 GB
DX9200HDDI-2500	Storage unit with 10 IDE hard drives totaling 2500 GB
DX9200HDDI-3000	Storage unit with 12 IDE hard drives totaling 3000 GB
DX9200HDDI-3250	Storage unit with 13 IDE hard drives totaling 3250 GB
DX9200HDDI-3500	Storage unit with 14 IDE hard drives totaling 3500 GB

FRONT VIEW

Figure 1 shows the features on the front of the IDE storage unit.
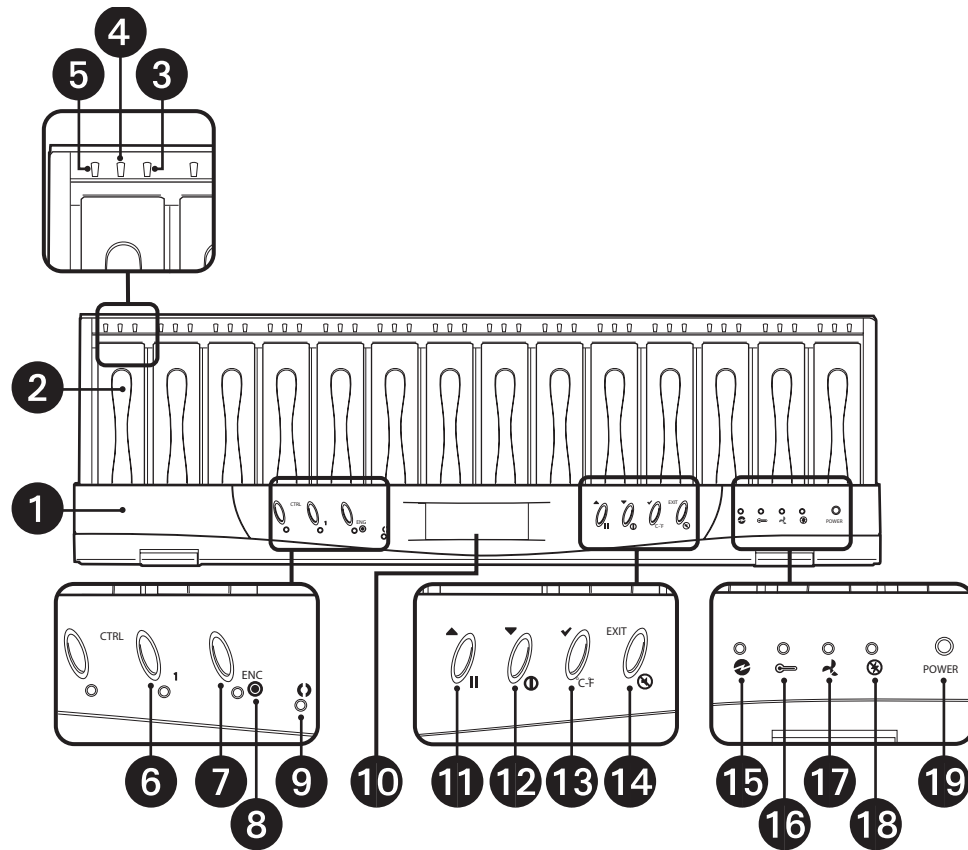

Figure 1. Front View

1. Panel: Use the features of this panel to view the configuration of the RAID or to enter the environment menu. You must lower this panel to remove or add hard drives.

2. Hard drive trays: There are 14 hot-swappable hard drive trays. Each holds an IDE hard drive. You can remove the hard drive tray by pulling on the lever.

3. HDD fault LEDs: Illuminate green when the power is on and the hard drive is present.

4. HDD activity LEDs: Blink blue when the hard drive is being accessed.

5. HDD power LEDs: Illuminate red when the hard drive fails or when no hard drive is present.

6. Controller button: Use to view the configuration of the storage unit, such as the memory size, firmware version, and the brand and capacity of the hard drives.

7. ENC button: Use to see the operating status of the storage unit, such as the hard drive status, temperature, power supplies, voltage, and cooling fans.

8. ENC global fault LED: Illuminates red and an alarm sounds when a fault condition occurs, such as power, fan, or hard drive failure.

9. Access LED: Blinks blue when data is being processed.

10. LCD display: This display shows your settings. The characters indicate hard drive information. See Table A for an explanation of each character.

11. Up arrow/Quit button: Used in conjunction with the Controller and ENC buttons. Press to scroll through the information on the LCD display, to move through each menu, or to go back to the previous menu.

12. Down arrow/Info button: Used in conjunction with the Controller and ENC buttons. Press to scroll through the information on the LCD display or to move through each menu.

13. Select/C-F button: Use to enter the option you have selected or to change the temperature display from celsius to fahrenheit.

14. Exit/Alarm reset button: Use to return to the previous menu or to stop an alarm.

15. Voltage warning LED: Illuminates red and an alarm sounds if the output DC voltage is under +5 V or over +12 V.

16. Over temp LED: Illuminates red and an alarm sounds if temperature irregularities occur.

17. Fan fail LED: Illuminates red and an alarm sounds when a fan's rotation speed is lower than 1000 rpm.

18. Power fail LED: Illuminates red and an alarm sounds if a redundant power supply fails.

19. Power LED: Green when the power is on.

BACK VIEW

Figure 2 shows the features on the back of the IDE storage unit.

Figure 2. Back View

1. Host channel A: Has two 68-pin SCSI connectors for SCSI In and Out.

2. Host channel B: Has two 68-pin SCSI connectors for SCSI In and Out.

3. Terminators: Attach to Host Channel A and B Out ports.

4. Fans: Provide sufficient airflow and heat dispersion inside the storage unit.

5. Power supplies: There are three power supplies. Each one has a green LED and a power switch. The third power supply is a backup.

6. Monitor port: Serial port that allows you to connect to a PC or terminal. Factory use only.

7. Modem port: Serial port that allows you to connect to a modem. Factory use only.

8. UPS port: Allows you to connect to a UPS device. Factory use only.

9. Power fault LED: Illuminates red if there is a problem.

10. Power reset switch: Press once to reset the power fault.

11. Main power switch: Turn on after turning on the three power supplies.

INSTALLATION

Make sure the following parts are supplied with the storage unit.

1	Video Storage Unit with IDE hard drives
2	Power cords (1 USA standard and 1 European standard)
2	External SCSI cables
2	Active terminators (for connecting to SCSI channels)
2	Brackets
	6 Screws, M4 x .250-inch, pan head
4	Adjustable support rails
	6 Screws, 8-32 x .375-inch, pan head with washers
12	Screws, 10-32 x .375-inch, flat head
4	Screws, 10-32 x .750-inch, Phillips, pan head with washers

CAUTION: The storage unit should be installed in an air-conditioned room where the temperature is maintained between 41° and 85°F (5° and 29°C) with relative humidity not to exceed 85 percent, noncondensing.

The storage unit should be connected to an uninterruptible power supply (UPS) capable of supplying a minimum of 5 A for 120 VAC power systems or 2.6 A for 230 VAC power systems.

MOUNTING

The storage unit can be placed on a flat surface, such as a shelf, or it can be installed in a 19-inch (48.26 cm) wide equipment rack.

NOTE: Allow one rack unit (1.75 inches or 4.5 cm) of space above the storage unit for air circulation.

To install the storage unit in an equipment rack:

1. Attach the two brackets to each side of the storage unit.

2. Attach the support rails to the equipment rack.

3. Place the storage unit onto the support rails. It should easily slide in and out of the rack.

4. Fasten the rack ears to the equipment rack.
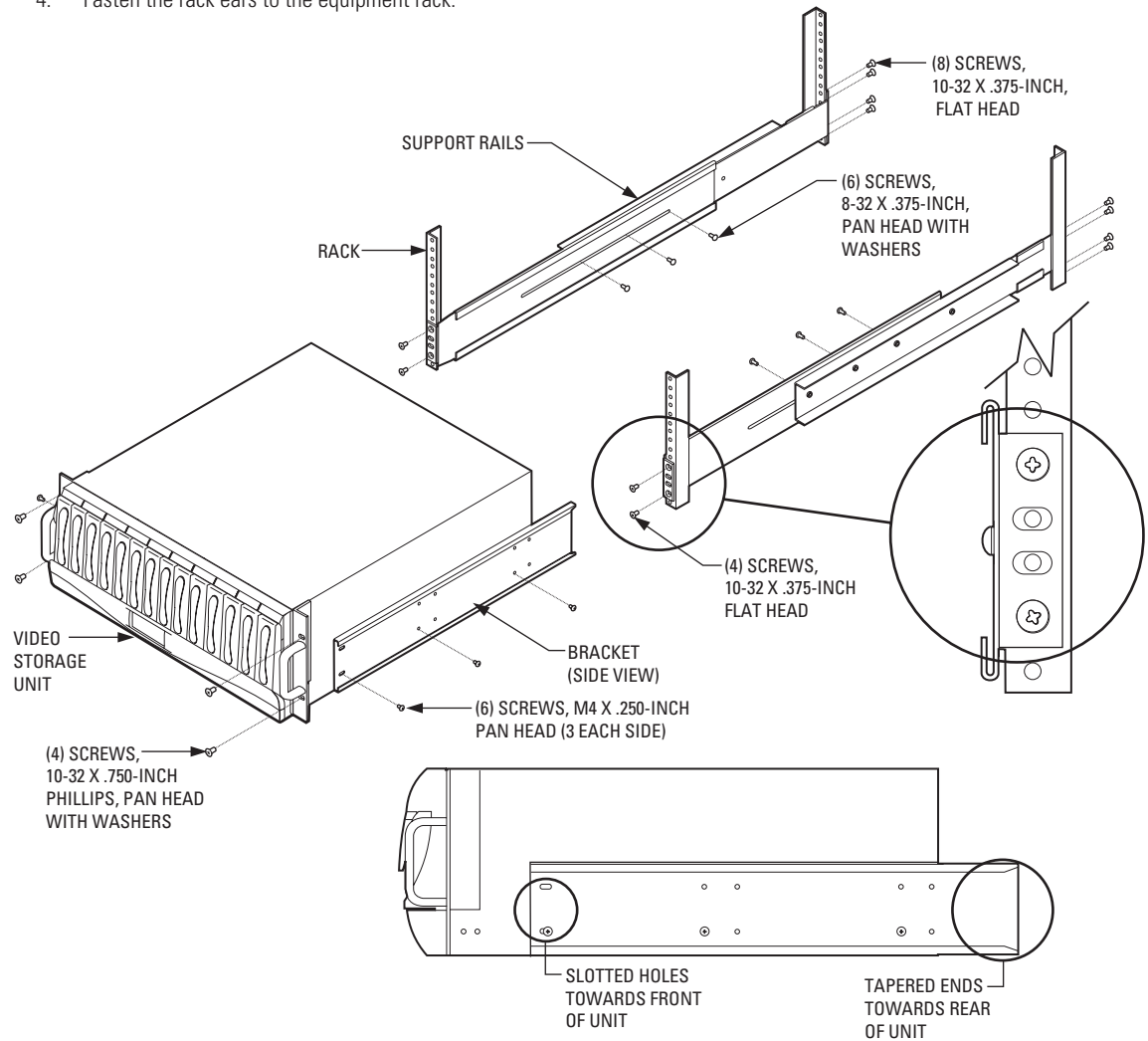
Figure 3. Rack Mount Installation

HARDWARE CONNECTIONS

There are five hardware configurations. You can connect one storage unit to one recorder, one storage unit to two recorders, two storage units to one recorder, three storage units to one recorder, or four storage units to one recorder.
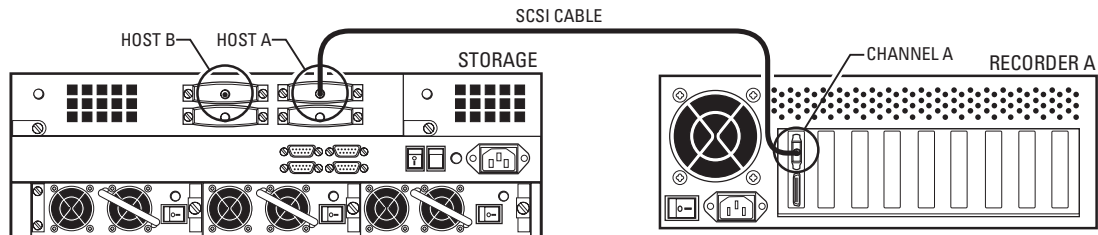
CONNECTING ONE STORAGE UNIT TO ONE RECORDER

1. Connect a SCSI cable from Host A on the storage unit to Channel A on the recorder.
2. Plug the power cords into the units and into a universal power supply (UPS).
3. Turn on the three power supplies on the rear of the storage unit. You can turn them on in any sequence.
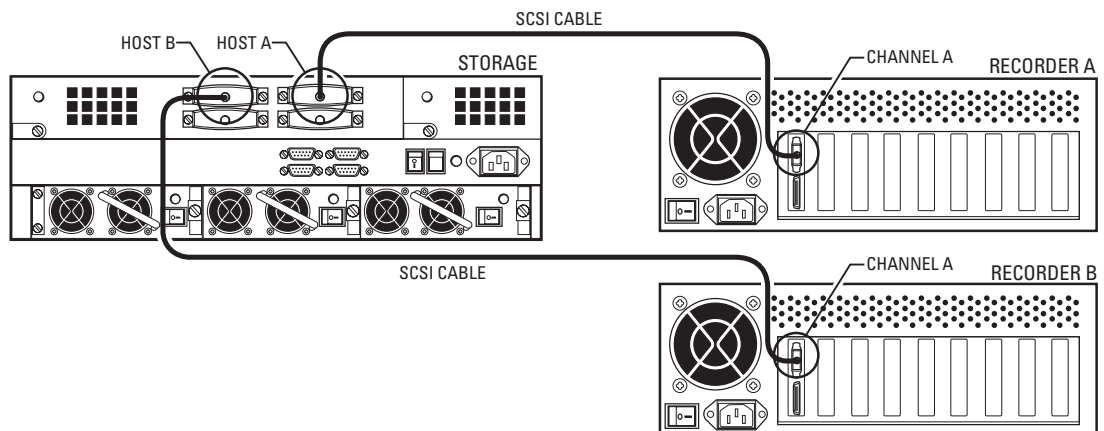4. Turn on the storage unit's main power.
5. Turn the recorder on.

Figure 4. One Storage Unit/One Recorder Configuration

CONNECTING ONE STORAGE UNIT TO TWO RECORDERS

1. Connect a SCSI cable from Host A on the storage unit to Channel A on Recorder A.
2. Connect a SCSI cable from Host B on the storage unit to Channel A on Recorder B.
3. Plug the power cords into the units and into a universal power supply (UPS).
4. Turn on the three power supplies on the rear of the storage unit. You can turn them on in any sequence.
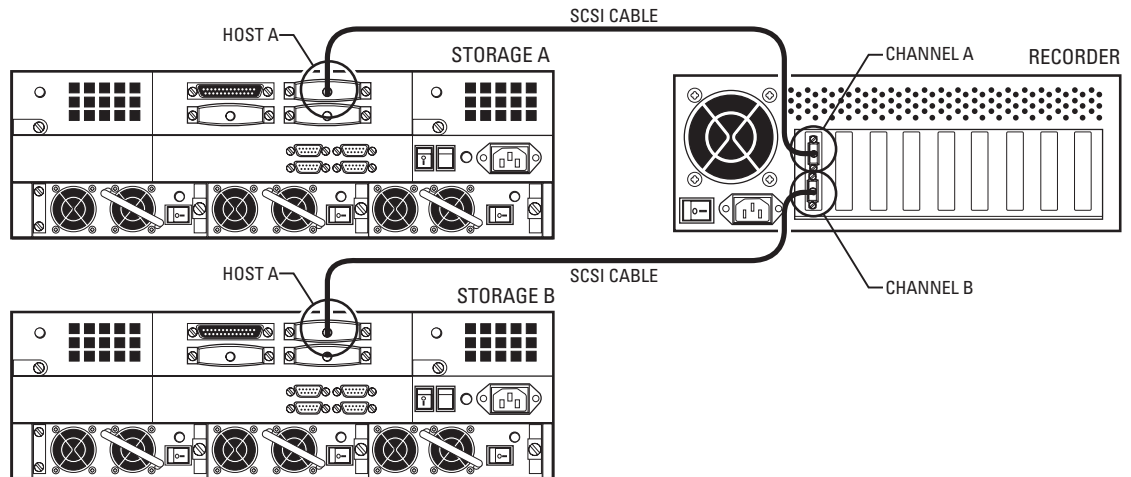5. Turn on the storage unit's main power.
6. Turn the recorders on.

Figure 5. One Storage Unit/Two Recorder Configuration

CONNECTING TWO STORAGE UNITS TO ONE RECORDER

1. Connect a SCSI cable from Host A on Storage A to Channel A on the recorder.

2. Connect a SCSI cable from Host A on Storage B to Channel B on the recorder.

3. Plug the power cords into the units and into a universal power supply (UPS).

4. Turn on the three power supplies on the rear of each storage unit. You can turn them on in any sequence.

5. Turn on each storage unit's main power.
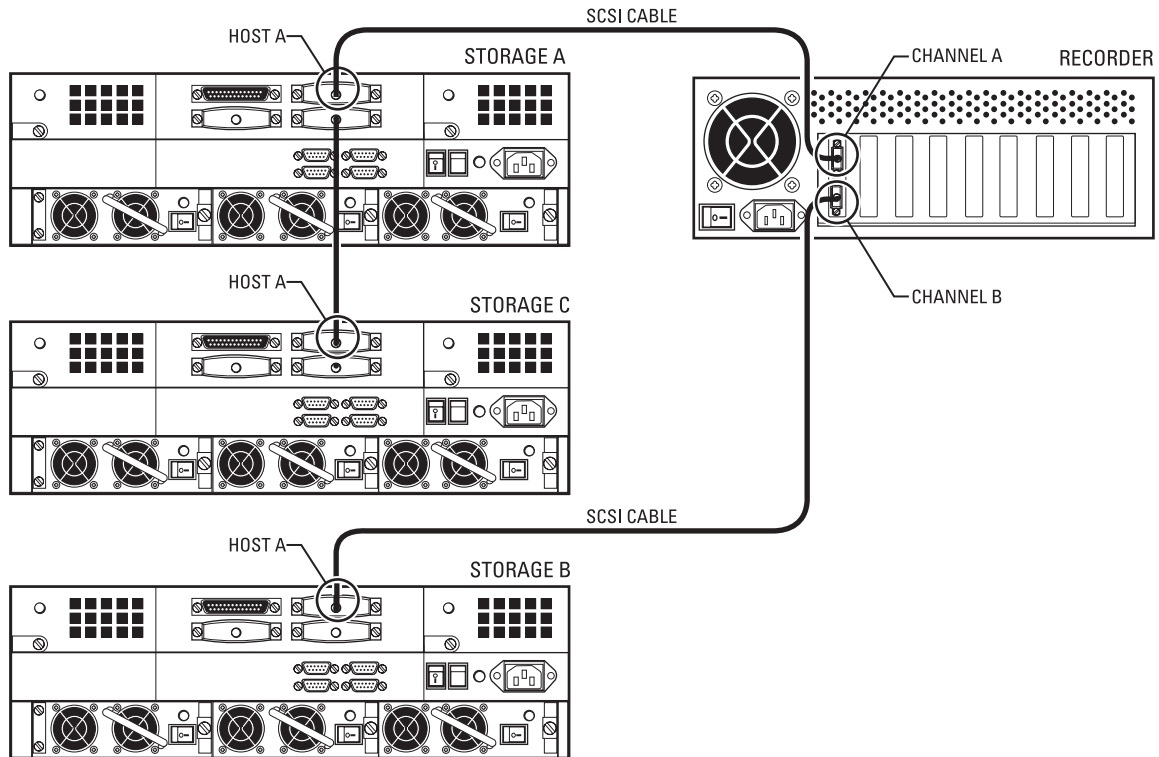
6. Turn the recorder on.

Figure 6. Two Storage Unit/One Recorder Configuration

CONNECTING THREE STORAGE UNITS TO ONE RECORDER

1. Connect a SCSI cable from Host A on Storage A to Channel A on the recorder.

2. Connect a SCSI cable from Host A on Storage B to Channel B on the recorder.

3. Connect a SCSI cable (DX9200HDDI-LCBL) from the Host A Out port on Storage A to the Host A In port on Storage C.

4. Plug the power cords into the units and into a universal power supply (UPS).

5. Turn on the power supplies on the rear of each storage unit. You can turn them on in any sequence.

6. Turn on each storage unit's main power.

7. Turn the recorder on.

Figure 7. Three Storage Unit/One Recorder Configuration

CONNECTING FOUR STORAGE UNITS TO ONE RECORDER

1. Connect a SCSI cable from Host A on Storage A to Channel A on the recorder.

2. Connect a SCSI cable from Host A on Storage B to Channel B on the recorder.

3. Connect a SCSI cable (DX9200HDDI-LCBL) from the Host A Out port on Storage A to the Host A In port on Storage C.

4. Connect a SCSI cable (DX9200HDDI-LCBL) from the Host A Out port on Storage B to the Host A In port on Storage D.

5. Plug the power cords into the units and into a universal power supply (UPS).

6. Turn on the power supplies on the rear of each storage unit. You can turn them on in any sequence.

7. Turn on each storage unit's main power.
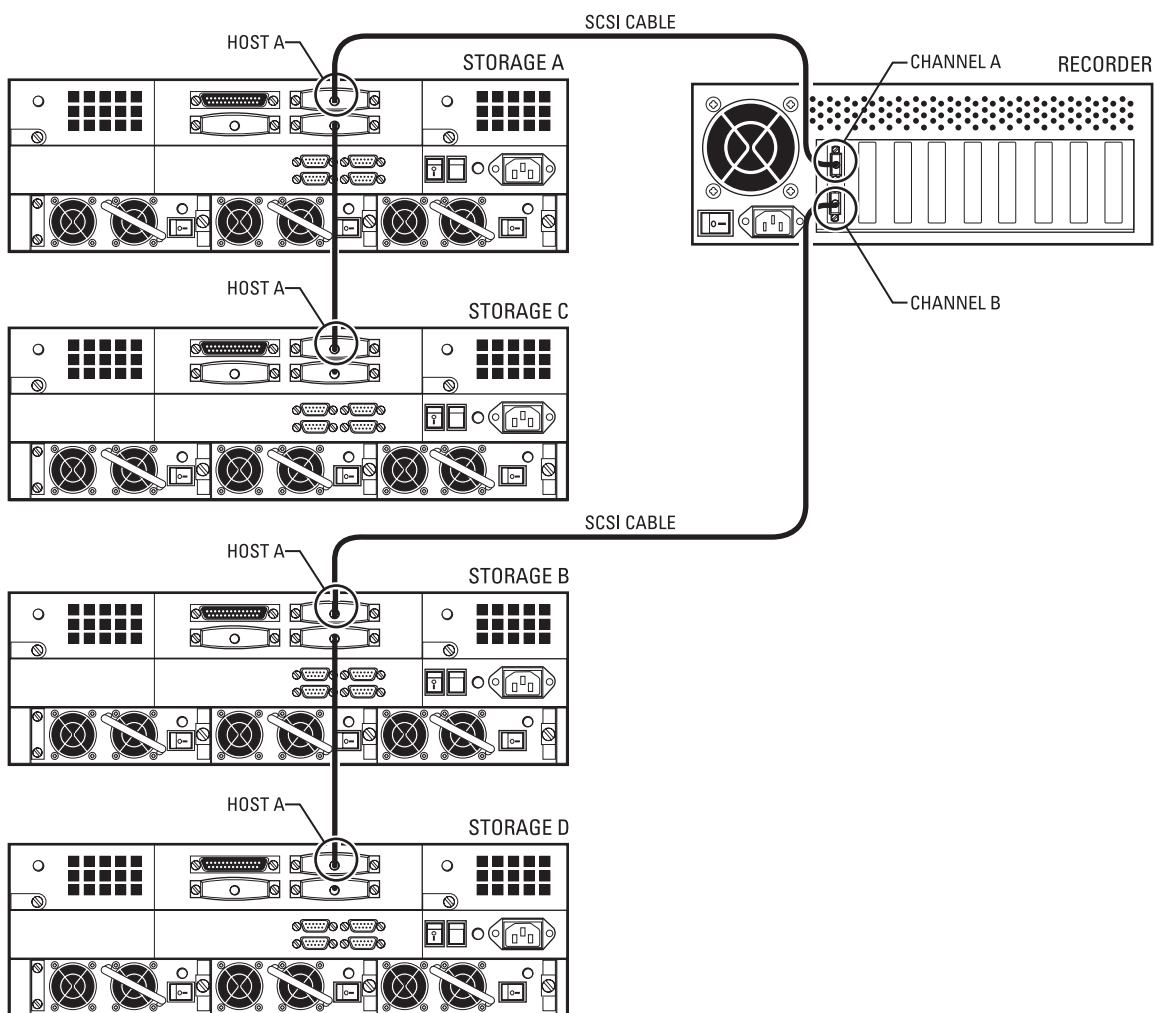
8. Turn the recorder on.

Figure 8. Four Storage Unit/One Recorder Configuration

OPERATION

The storage unit has been preconfigured to operate using RAID Level 5 or RAID Level 5+1 technology. Pelco recommends RAID Level 5+1. In Level 5+1, a hot spare drive is included. If a hard drive is removed or fails, the redundant data, on the remaining drives, relocates automatically to the hot spare and begins the reconstruction process without user intervention. In Level 5, all data and parity blocks are divided between the hard drives in such a way that if any hard drive is removed or fails, the data on the missing hard drive can be reconstructed using the data on the remaining hard drives.

The LCD display on the front of the unit shows your settings. The characters indicate hard drive information. An "S" on the LCD display means that the storage unit has a spare hard drive and is operating using RAID Level 5+1. If an "S" is not displayed, the storage unit is operating using RAID Level 5." See Table A for an explanation of each character.

Table A. LCD Display Status Characters

Character	Definition
X	There is not a hard drive installed on the slot.
I	Hard drive was detected.
S	Spare hard drive.
A	Rebuilding the new hard drive.
R	The previous online hard drive has been removed.
1	The hard drive is part of array 1.
2	The hard drive is part of array 2.
Flashing square	Indicates that the unit is operating properly.
ZZ	Flashes when the host has access to the unit.
WW	Flashes when the memory writes the cache to a hard drive.

The front of the unit also has six buttons. See Table B for an explanation of each button's function.

Table B. Button Definitions

Button	Definition
Controller button	Press to view the configuration of the storage unit, such as the memory size, firmware version, and the brand and capacity of the hard drives.
ENC button	Press to see the operating status of the storage unit, such as the hard drive status, temperature, power supplies, voltage, and cooling fans.
Up arrow/Quit button	Used in conjunction with the Controller and ENC buttons. Press to scroll through the information on the LCD display, to move through each menu, or to go back to the previous menu.
Down arrow/Info button	Used in conjunction with the Controller and ENC buttons. Press to scroll through the information on the LCD display or to move through each menu.
Select/C-F button	Press to enter the option you have selected or to change the temperature display from celsius to fahrenheit.
Exit/Alarm reset button	Press to return to the previous menu or to stop an alarm.

TROUBLESHOOTING

What do I do when the voltage warning LED illuminates red and an alarm sounds?
This happens when the output DC voltage is under 4.5V or over 5.5V, and under 10.2V or over 13.8V. The
ENC global fault LED also illuminates. Press the Exit/Alarm reset button to stop the alarm. A low beep continues to sound.
There may be a problem with the voltage of the power outlet. Call technical support for assistance.

What do I do when the over temperature LED illuminates red and an alarm sounds?
The ENC global fault LED also illuminates. Press the Exit/Alarm reset button to stop the alarm. A low beep continues to sound.
Check the temperature reading of the hard drive slots on the LCD display. Replace the hard drive if the hard drive slot
temperature is over 113°F/55°C or under 32°F/0°C. Check to see if the fan fail LED is illuminated. If so, replace the fan(s).
Refer to the *Service* section.

What do I do when the fan fail LED illuminates red and an alarm sounds?
The ENC global fault LED also illuminates. Press the Exit/Alarm reset button to stop the alarm. A low beep continues to sound.
The LCD display shows which fan has a problem and the fan's LED on the rear illuminates red. Make sure the fan is secure. If it
is not secure, remove it, and reinsert it. If the low beep continues, the fan is defective and must be replaced. Refer to the
Service section for instructions on how to replace a failed fan.

What do I do when the power fail LED illuminates red and an alarm sounds?
The ENC global fault LED also illuminates. Press the Exit/Alarm reset button to stop the alarm. A low beep continues to sound.
The LCD display shows which power supply has a problem and the power supply's green LED illuminates red. Make sure the
power supply is secure and the power switch for that particular power supply is on. If it is not secure, remove it, and reinsert it.
If the low beep continues, the power supply is defective and must be replaced. Refer to the *Service* section for instructions on
how to replace a failed power supply.

HOW TO REPLACE A FAN

The fans are hot-swappable. The spare part number for the fan is DX9200HDDI-FAN.
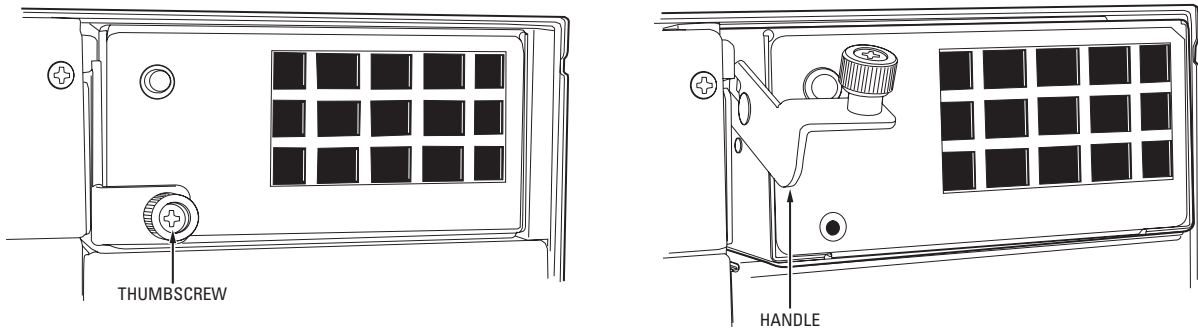

Figure 9. Replacing a Fan

1. Loosen the thumbscrew.
2. Pull the screw to lift the handle.
3. Pull out the defective fan.
4. Slide the new fan into the unit.
5. Tighten the screw.

HOW TO REPLACE A POWER SUPPLY

The power supplies are hot-swappable. The spare part number for the power supply is DX9200HDDI-PWR.
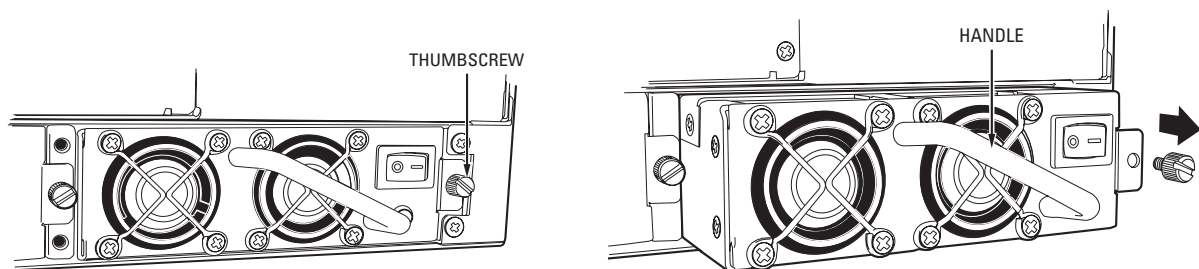

Figure 10. Replacing a Power Supply

1. Remove the thumbscrew.
2. Pull out the defective power supply.
3. Slide the new power supply into the unit.
4. Tighten the screw.

HOW TO CHANGE FROM RAID 5 TO RAID 5+1

To change a RAID 5 configuration to a RAID 5+1 configuration, you must add a hot spare hard drive. A hot spare hard drive becomes the replacement hard drive when a hard drive fails in the RAID 5+1 configuration. Make sure you have the appropriate spare drive from Pelco: DX9000DRV-I120 or DX9000DRV-I250.

Because the hard drives are hot-swappable, you do not have to shut down the power before adding or removing them.

WARNING: Handle the hard drive with extreme care. Do not drop or jar the hard drive as delicate components inside may be damaged. Observe electrostatic discharge (ESD) precautions: Use a grounded wrist strap when handling the hard drive. Avoid touching electronic components.

---

1. Lower the panel on the front of the storage unit.
2. Locate an empty hard drive tray. Refer to the LCD display to see which slot is empty.
3. Push down the lever release.
4. Pull out the empty hard drive tray.
5. Set the jumper on the hard drive to "Master."
6. Connect the power connector to the power port on the hard drive.
7. Connect the 40-pin 80-conduction ATA cable connector to the ATA cable connector port on the hard drive.
8. Place the hard drive in the tray and secure it using the four Phillips screws.
9. Slide the tray into the empty slot until it clicks into place.
10. Push the lever down until you hear it click into place.
11. Raise the panel.

An "S" appears on the LCD display indicating the slot with the hot spare hard drive.

HOW TO REPLACE A FAILED HARD DRIVE

The DX9000 continues to operate properly if one hard drive fails. If two hard drives fail, however, the system does not operate properly. Make sure a failed hard drive is replaced immediately.

WARNING: Handle the hard drive with extreme care. Do not drop or jar the hard drive as delicate components inside may be damaged. Observe electrostatic discharge (ESD) precautions: Use a grounded wrist strap when handling the hard drive. Avoid touching electronic components.

In a RAID 5 configuration, when you replace a failed hard drive, the new hard drive rebuilds automatically. In a RAID 5+1 configuration, when you replace a failed hard drive, the new hard drive becomes the hot spare. Make sure you have the appropriate hard drive from Pelco: DX9000DRV-I120 or DX9000DRV-I250.

1. Lower the panel on the front of the storage unit.
2. Push down the lever release.
3. Remove the tray that has the failed hard drive. The LED of the failed hard drive should be red.
4. Remove the defective hard drive from the tray by unscrewing the four Phillips screws.
5. Set the jumper on the replacement hard drive to "Master."
6. Connect the power connector to the power port on the hard drive.
7. Connect the 40-pin 80-conduction ATA cable connector to the ATA cable connector port on the hard drive.
8. Place the hard drive in the tray and secure it using the four Phillips screws.
9. Slide the tray into the empty slot where the defective hard drive was until it clicks into place.
10. Push the lever down until you hear it click into place.
11. Raise the panel.

Make sure the hard drives are installed in the correct slots. If the hard drives are installed in the wrong slots, the DX9000 system will not operate properly.
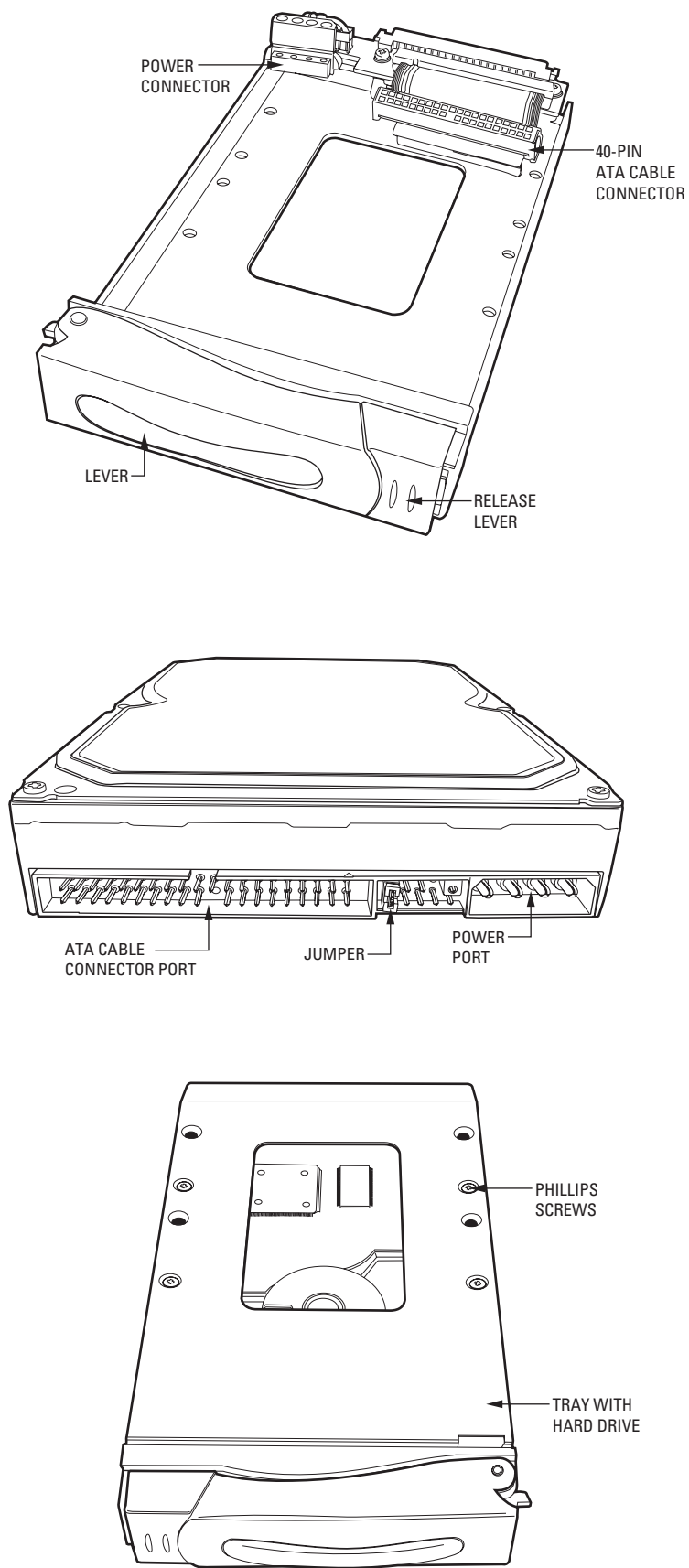
POWER
CONNECTOR

40-PIN
ATA CABLE
CONNECTOR

LEVER

RELEASE
LEVER

ATA CABLE
CONNECTOR PORT

JUMPER

POWER
PORT

PHILLIPS
SCREWS

TRAY WITH
HARD DRIVE

Figure 11. Adding a Hard Drive

WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship for a period of one year after the date of shipment. Exceptions to this warranty are as noted below:

- Five years on Pelco manufactured cameras (CC3500/CC3600/CC3700 and MC3500/MC3600 Series); two years on all other cameras.
- Three years on Genex® Series (multiplexers, server, and keyboard) and 090 Series Camclosure® Camera System.
- Two years on 100/150, 200 and 300 Series Camclosure® Camera Systems.
- Two years on all standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM8500/CM9500/CM9740/CM9760 Matrix, DF5 and DF8 Series Fixed Dome products.
- Two years on Spectra®, Esprit®, and PS20 Scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico:
Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico:

Intermediate Consignee	***Ultimate Consignee***
American Overseas Air Freight	Pelco
320 Beach Road	3500 Pelco Way
Burlingame, CA 94010	Clovis, CA 93612-5699
USA	USA

REVISION HISTORY

Manual #	Date	Comments
C637M	5/03	Original version.
C637M-A		Revised parts list.
C637M-B	10/03	Added two hardware configurations to the *Hardware Connections* section.